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PERMANENT ADDRESS:

3604 - 113 A St.

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THE UNIVERSITY OF ALBERTA

THE RELATIONSHIP BETWEEN SOCIAL BEHAVIOR, PICTURE AND WORD IDENTIFICATION AND READING ACHIEVEMENT OF GRADE TWO CHILDREN

by

(C)

H. PAULINE HOBBS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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EDMONTON, ALBERTA

FALL, 1973

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "The Relationship Between Social Behavior, Picture and Word Identification, and Reading Achievement of Grade Two Children" submitted by H. Pauline Hobbs in partial fulfilment of the requirements for the degree of Master of Education.

W. Fagan
Supervisor

H. W. Zingle

Jean Robertson

Date July 1973

ABSTRACT

In discussing reading failure, writers inevitably indicate the existence of a relationship between reading failure and inappropriate social behavior. The purpose of this study was to measure the overt social behavior of grade two children and to study the learning styles or strategies of these children in a picture and a word identification situation. It was further proposed that, both social behavior and learning styles or strategies as indicated by scores on picture and word identification tasks for both constant and variable words would be related to the children's levels of reading achievement, chronological age, I.Q., and sex.

The sample consisted of forty-eight grade two children, whose I.Q. scores were average or above. There were twelve boys and twelve girls in each of the negative and the positive social behavior groups who were chosen on the basis of teacher ratings on the Devereux Elementary School Behavior Rating Scale. (DESB)

Each child was administered the Keystone Visual Screening Test and the VASC audiometer to ensure adequate vision and hearing. The Canadian Cognitive Abilities Test (P2/F1) was used as an estimate of I.Q. and the Neale Analysis of Reading Ability was administered to assess reading achievement.

The picture and word identification tasks for both constant and variable words were constructed by the researcher for this study. The word identification tasks consisted of pronouncing nonsense words which were embedded in reading passages. The picture identification

tasks consisted of associating a verbal response to a neutral picture after these had been presented to the children.

Findings showed that the two behavior groups differed significantly on reading achievement and that there was a significant relationship between behavior rating scores and reading achievement scores. The results of this study indicate that the Devereux Elementary School Behavior Rating Scale is a good predictor of reading achievement. It was also found that the two behavior groups differed significantly on picture and word identification tasks with both constant and variable words. The positive behavior group always scored higher.

Although both behavior groups performed better on identification tasks involving constant words, there was no significant difference favoring the learning of either constant or variable words.

There were significant correlations between picture and word identification tasks and I.Q. and reading achievement. However there were no significant correlations between picture and word identification tasks and chronological age.

Boys and girls did not differ in their performance on the various learning tasks nor on their reading achievement scores. It appeared that reading achievement related more to social behavior ratings than to the sex of the children in the sample.

The findings of this study indicate the need for a prevention program aimed at negative behavior children or potential low reading achievers.

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CHAPTER I

INTRODUCTION AND PROBLEM

Jansky and De Hirsch (1972) have indicated that reading failure represents a lifetime disability for the individual and a major impediment to social progress. In discussing reading failure, writers inevitably indicate a relationship between reading failure and personality or inappropriate social behavior.

Experimental studies carried out by Athey and Holmes (1969), Malmquist (1958), De Hirsch, Jansky and Langford (1966), Glick (1972), Tabarlet (1958) and Spivack and Swift (1967, 1968, 1969, 1972) have all reported statistically significant relationships between reading achievement and social behavior characteristics.

Although social behaviors have been measured by a variety of techniques and tend to measure different aspects of social behavior, the rating scale of Spivack and Swift (Devereux Elementary School Behavior Rating Scale (DESB)(1967) appears to tap a large number of the relevant social behaviors generally found in normal elementary school children. Swift and Spivack (1968) reported that the fourteen behavior factors measured by their scale are significantly related to academic achievement. It appears to be important not only to observe and relate behavior scores to achievement, but also, to ascertain if different behavior groups use different learning strategies in learning to identify and remember words.

Studies have been carried out on groups of mentally retarded

and non-mentally retarded children, groups of different socio-economic groups and groups composed of children and adults. However, there does not appear to be any research to date in the important area of comparing the learning styles and strategies of different behavioral groups in learning to identify and remember words.

In the field of beginning reading, Aukerman (1971) has reported over one hundred different approaches to teaching reading. It is assumed that individuals learn differently when taught by different methods. Most of these teaching methods could be subsumed under one of the following approaches (a) Phonics, (b) Spelling Patterns (c) Word Families and (d) Modified alphabets, for example, Initial Teaching Alphabet. Consequently, studies have been carried out to prove the efficacy of the different approaches.

A large number of studies have been carried out which contrast the learning of highly similar or constant word lists with variable word lists. While the definitions of similar and variable word lists vary, some high similarity word lists have a one-to-one correspondence between grapheme and phoneme.

Gibson, Osser and Pick (1963) found that regardless of the teaching approach used, children in the early stages of reading, read in short units and tend to generalize certain consistent predictions of grapheme-phoneme correspondence. These researchers found that this generalization process promotes reading efficiency and could be facilitated if materials which have consistent grapheme-phoneme correspondence were presented to beginning readers. They indicated that the presentation of such materials would speed up success in reading.

There does not appear to be any research contrasting the learning of constant word lists composed of words which all contain a common spelling to sound pattern, with variable word lists which do not have a constant spelling to sound pattern within each word.

I. PURPOSE

The purpose of this study is to measure the overt social behavior of grade two children, and to study the learning styles or strategies of these children in a picture and a word identification situation. Both social behavior and learning styles or strategies as indicated by scores on picture and word identification tasks for both constant and variable words will be related to the children's levels of reading achievement, chronological age, sex, and I.Q.

II. DEFINITION OF TERMS

For the purposes of this study, terms are defined as follows:

Word Identification refers to the ability to pronounce nonsense words in a reading passage situation.

Picture Identification refers to the ability to associate the correct verbal response to a neutral picture after the picture and word have been presented together.

Spelling Pattern refers to a combination of at least two letters which have a constant sound-symbol correspondence regardless of the context in which they are found. For example, "e" may have a number of sounds, "el" has a constant sound in "help", "bell", and "belt". In this study, the spelling pattern "in" is used.

Constant Words refer to nonsense words which have a common

spelling pattern within each word.

Variable Words refer to nonsense words which do not have constant spelling patterns, but have a different letter in each letter position of each word.

Learning Styles or Strategies refers to the processes which children use to identify pictures and words which are reflected in the scores obtained for both pictures and word identification tasks and subsumes both constant and variable words. It is assumed that children use different learning styles when different word structures (constant and variable) are used to present the words.

Social Behavior refers to observable behavior such as classroom disturbance, creative initiative, and impatience which can be rated by teachers and subsumes both positive and negative social behavior.

Negative Social Behavior refers to observable behavior such as inattentive, withdrawn behavior. In this study a child will be described as exhibiting negative social behavior if he attains a raw score of 138 or higher on the DESB according to the scoring procedure which is outlined in Chapter III.

Positive Social Behavior refers to observable behavior such as the ability to apply what one has learned to a new situation and the ability to become constructively and actively involved in the classroom setting. In this study a child will be described as exhibiting positive social behavior if he attains a raw score of 112 or lower on the DESB.

Reading Achievement refers to raw scores for reading accuracy

and reading comprehension on the Neale Analysis of Reading Ability test.

III. HYPOTHESIS

Research Hypothesis 1

Grade two children exhibiting negative social behavior will score lower on a reading achievement test than children exhibiting positive social behavior.

Null Hypothesis

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) reading accuracy scores on the Neale Analysis of Reading Ability

(b) reading comprehension scores on the Neale Analysis of Reading Ability

Research Hypothesis 2

Grade two children exhibiting positive social behavior will score higher on the picture identification tasks than children exhibiting negative social behavior.

Null Hypothesis

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) picture identification of constant words

(b) picture identification of variable words

Research Hypothesis 3

Grade two children exhibiting positive social behavior will

score higher on the word identification tasks than children exhibiting negative social behavior.

Null Hypothesis

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) word identification of constant words for the pre-test

(b) word identification of constant words for the post-test

(c) word identification of variable words for the pre-test

(d) word identification of variable words for the post-test

Research Hypothesis 4

Grade two children exhibiting negative social behavior will learn the constant word picture identification tasks more rapidly than the variable word picture identification tasks.

Null Hypothesis

There is no significant difference between the scores obtained by the negative social behavior children on picture identification of constant words and picture identification of variable words.

Research Hypothesis 5

Grade two children exhibiting negative social behavior will score higher on the word identification tasks with constant words than with variable words.

Null Hypothesis

There is no significant difference between the scores obtained by the negative social behavior children on:

(a) pre-test scores for constant and variable words

(b) post-test scores for constant and variable words

Research Hypothesis 6

Grade two children exhibiting positive social behavior will score equally high on both constant and variable picture identification tasks.

Null Hypothesis

There is no significant difference between the scores obtained by the positive social behavior children on picture identification of constant words and picture identification of variable words.

Research Hypothesis 7

Grade two children exhibiting positive social behavior will score equally high on the word identification tasks.

Null Hypothesis

There is no significant difference between the scores obtained by the positive social behavior children on:

(a) pre-test scores for constant and variable words

(b) post-test scores for constant and variable words

Research Hypothesis 8

The word and picture identification scores of grade two children will be related to their scores on reading accuracy, and reading comprehension, and to the sex, chronological age, and I.Q. scores of the children.

Null Hypothesis

There is no significant relationship between word and picture identification scores and:

(a) sex

(b) I.Q.

(c) chronological age

(d) reading accuracy

(e) reading comprehension

The null hypotheses will be considered rejected when the probability of the results occurring by chance is .05 or less.

IV. ASSUMPTIONS

It is assumed that children's learning will be different when learning tasks are presented with a different focus on the structure of the word, that is, where the word is of a constant or variable nature.

It is also assumed that the actual performance of the children in terms of scores obtained, is indicative of their ability to learn through the different tasks presented.

A third assumption is that the performance of the children in this study is representative of grade two children throughout the Edmonton Public School System, and not biased by the particular schools used in this study.

V. LIMITATIONS

The findings of this study are limited in the following ways:

(1) The children in this study were taught and tested individually. It is possible that the results for the learning tasks might have been different in a regular classroom where the children do not have a one-to-one teaching relationship with the teacher.

(2) The two behavior groups were chosen on the basis of teacher ratings, which could vary from teacher to teacher and school to school.

(3) The sample for the present study was selected from six classrooms of three urban schools within the city of Edmonton, Alberta. Students from other areas may exhibit different behaviors and learning strategies or styles.

(4) Children scoring more than one standard deviation below the mean I.Q. score were eliminated from this study. Therefore, generalizations from this study to children with lower I.Q.'s would not necessarily be applicable.

(5) The children in this study were tested after seven months in grade two. Therefore, generalizations would be restricted to students with similar school experience.

VI. SIGNIFICANCE OF THE STUDY

The present study may indicate the presence or absence of a relationship between social behavior (as measured by the DESB) and reading achievement. If, as previous studies have indicated, there is a close relationship between social behavior and reading achievement, this will indicate the value of the DESB as a predictor of reading failure. However, merely predicting reading failure would be of little value to the classroom teacher unless remediation programs or special teaching techniques were developed to overcome both the reading and the behavior problems.

If in the experimental study, differences are found in reading achievement and learning strategies of the two social behavior groups, this would suggest the necessity for modifying teaching methods.

The present study may also indicate the advantages for learning materials of either a constant or a variable nature, for the different behavioral groups. Thus, instructional materials could be designed to have similar structure among words to be taught.

VII. OVERVIEW OF THE STUDY

Chapter I has included the introduction and the problem of the study as well as the purpose, the definition of terms, the hypothesis, the assumptions, the limitations and the significance of the study.

Chapter II will review the available literature which is pertinent to this study and hopefully provide a framework for the present study.

Chapter III will consist of the experimental design of the study and will include information on the pilot study; the sample; the standardized tests; the construction and administration of the experimental tests; and a description of the procedures used for collection of the research data.

Chapter IV will present the results of the study which will be analyzed and explained.

Chapter V will include the summary, conclusion, implications and suggestions for further research.

CHAPTER II

THE BACKGROUND OF THE STUDY

In order to provide a background of information for this study, this chapter will contain a review of the literature and research studies that are relevant to social behavior, learning styles or strategies and reading achievement.

The chapter will be organized in the following manner.

Section I will be concerned with social behavior and reading achievement.

Section II will be concerned with learning styles or strategies and reading achievement.

Section III will be related to social behavior and learning styles and strategies.

I SOCIAL BEHAVIOR AND READING ACHIEVEMENT

Over many years, educators have observed a relationship between reading difficulties and the nature of children's behavior. There are many views regarding the relationship between reading disability and social behavior. Some writers hypothesize that unsatisfactory classroom behavior causes reading problems, while others believe that the two are closely related and may both be caused by a third factor. No matter which view is correct, there appears to be a relationship between social behavior and reading difficulty.

Although the terminology for social behavior varies widely to

include references to terms such as: introversion, extroversion, personality factors, emotional factors, psychological factors, it is clear as Athey and Holmes (1969) have pointed out that almost any general textbook on reading is likely to contain a section on social behavior or personality and reading.

Table I summarizes the behavioral descriptions of poor readers by a number of writers over the last thirty-five years.

TABLE I

Writer	Description of Behavior of Poor Readers
Gates (1936)	- Stuttering, nail biting, defiant conduct, bullying, day-dreaming, and inattentive behavior.
Gates (1941)	- Nervousness, withdrawal, aggression, defeatism, chronic worry.
Robinson (1946)	- Frequent frustrations resulting in loss of interest, lack of application, and lowered motivation.
Bond and Tinker (1957)	- Emotional tension manifested by symptoms such as shyness or retiring behavior, lack of attentive concentration, habitual nail biting, a tendency to stutter, discouragement, and irritability or aggressive behavior.
Gray and Reese (1957)	- Evidence of shyness, showing off, bullying and nervous tension.
Austin, Bush and Huebner (1961)	- Undesirable extremes of tenseness, withdrawal, apathy, sensitivity, anxiety and resistance.
Spache and Spache (1969)	- Excessive timidity or fearfulness, hyperactivity and overaggressiveness.

Dechant (1970) - Tense, antagonistic, self-conscious, nervous inattentive, defensive, discouraged, irritable, fearful, frustrated, defiant, indifferent, restless, and hypercritical.

Harris and Sipay (1971) - increasing discouragement, decreased concentration, attention and motivation, avoidance of reading, fear, anger, shame and embarassment.

Experimental Studies

The first experimental study which used recorded measures of social behavior in a study of reading achievement was carried out by Malmquist (1958) in Sweden. His aim was to include as many significant factors as possible which were related to reading achievement. He also attempted to study the simultaneous interactions of these variables in order to determine the relationships of these different variables to reading achievement.

The personality traits investigated in the Malmquist study included: Self-confidence; Social attitude 1 (ability to make contacts); Social attitude 2 (need of contacts); Persistence; Ability to concentrate; Dominance-submissiveness; Emotional stability-nervousness; and Intelligence (as rated by teachers).

Malmquist indicated that the presence of some of his personality traits were based on observations by teachers, while others were based on observations by parents. His findings indicated that parental ratings were not reliable, but that the results of the teacher ratings were significant and that there was a significant relationship between good and poor readers with regard to all of the personality variables measured with the exception of Social attitude

2 (need of contacts).

In his summary, Malmquist states:

> Poor readers tend to have less self-confidence, less ability to make contacts, less persistence and concentration, and are more inclined to submit to the leadership of others than to take the lead themselves in a group of their comrades, and are not as intelligent as good readers, and are more prone to nervousness than the latter (p. 374).

De Hirsch, Jansky and Langford (1966) attempted to develop diagnostic criteria in order that they could predict reading failure at an early age. Their study of fifty-three subjects was carried out over a period of three years. Thirty-seven different tests were administered to the subjects during their kindergarten year, and reading, writing, and spelling tests were administered to the subjects at the end of grade one and grade two.

One of the many tests which were significantly related to reading achievement, spelling and writing at the end of grade two, was their test of Behavioral Control. Although this test is not described, it appears to be an observed score for hyperactive, distractible and disinhibited behavior.

Of the eight children designated as failing readers five were described as markedly hyperactive while three were described as hypoactive. Six of the eight children in this group were boys.

De Hirsch et al divided the subjects into four groups according to the style of approach used by the children during the testing session. The behavior of two of the groups which were made up of the poor achievers were described as being boisterous, cheerful children with severe difficulties with behavioral control. They were

also described as being unable to maintain the necessary attention for certain tasks. Others were described as passive, infantile, and dependent children (p. 78).

The consistency of behavior and approach to learning was most apparent in this study. The writers reported that the majority of the children did not change their behavior during the three years of the study and were essentially the same children after they had completed grade two as they were at the beginning of kindergarten.

A recent study carried out by Glick (1972) investigated some of the consequences of early reading failure in relation to the areas of the self-concept, attitudes towards school, peer relations and parental behavior.

Data were collected for poor and good readers at the beginning and end of grade three in each of the above mentioned areas.

Significant relationships between initial reading levels and social-emotional changes were found. One of the most significant findings was the difference in the nature of the relationships in the social-emotional areas for boys as compared to girls. It was found that boys were punished for inadequate school performance but received little support or reinforcement for good school performance, while girls were generally praised for good school performance and not punished for inadequate school performance. Glick indicates that "the pattern of sex differences suggests that responses to early reading performance by educators, parents and peers are different for males than females (p. 257)."

Glick emphasizes that educators are directly involved in the

social-emotional, as well as the intellectual development of all pupils. He also hypothesizes that the family, school, and community tend to punish boys for inadequate school performance and yet do not reward them for good school performance.

One of the shortcomings of this study is the dearth of reported information outlining the modifications of three of the four tests used by the investigator.

Tabarlet's (1958) research attempted to answer the question: "Are retarded readers and average readers really different as to various aspects of mental health (p. 522)?" The mental health measures included The Mental Health Analysis and a sociometric questionnaire to measure social adjustment.

There were comparison groups of average and retarded readers in this study. The retarded reader group was composed of thirty-four boys and nine girls in grade five who were reading at the third grade level. This is similar to the above studies which all have a preponderance of boys in the non-achieving group.

The results of this study indicated that five of the ten subscores including: Behavioral Immaturity, Inter-Personal Skills, Social Participation, Satisfying Work and Recreation, and Adequate Outlook and Goals as well as the total score on the Mental Health Analysis showed significant differences between the two groups. The differences on the two social adjustment scores also favored the average readers and were highly significant.

Although the findings do not show a cause and effect relationship between poor mental health and reading retardation, they do

indicate that there is a close relationship between poor mental health and reading retardation.

In this study, there were no separate results reported for the different sexes nor was there any indication of similarity or differences in the intelligence of the two groups.

A longitudinal study on learning and behavior disorders was carried out throughout the state of Minnesota by Rubin and Balow (1971). A total of 967 children in kindergarten through grade three were studied annually with measures of educational and behavioral characteristics.

The total sample had been tested on the Illinois Test of Psycholinguistic Abilities, the Stanford Binet I.Q. Test and the Metropolitan Readiness Tests prior to school entrance. It was found that the test scores of the group closely approximated the scores obtained by the normative samples used in the standardization of these tests. It was also determined that the subjects were normal with regard to socioeconomic and medical-neurological characteristics.

Classroom teachers supplied data with regard to (a) grades repeated, special services received and special services needed; (b) a comparison of the subjects to their classmates on achievement in reading, spelling, writing and arithmetic; and (c) an indication of whether or not the subjects showed attitude or behavior problems.

A total of 41.1 percent of the children in this longitudinal study were identified in one or more problem categories. Teachers reported twenty-eight percent of the subjects as manifesting behavioral problems, although the decision as to what constituted a

problem was left up to the individual teachers.

At each grade level boys were consistently rated as showing more problems than girls. This finding is similar to those of Glick (1972), De Hirsch et al (1966), and Tabarlet (1958).

Rubin and Balow summarized their research by indicating that:

> The findings suggest that schools and teachers are oriented to a narrow band of expected pupil behaviors which are not consonant with typical behavior patterns of young boys; any pupil outside of that narrow range is treated as needing special attention (p. 298).

Swift and Spivack have published a series of reports from 1964 to 1972 dealing with their longitudinal studies of overt classroom behavior. Most of these reports deal with the formulation, testing, and norming of the Devereux Elementary School Rating Scale (DESB) (1967) which appears to tap most of the relevant behaviors tested in the studies previously mentioned.

The DESB scale consists of forty-seven behavior items which the teacher rates either on the basis of frequency of occurence or on the basis of the degree of behavior. The eleven behavioral factors are made up of three or more scale items and make up the following behavioral factors:

1. Classroom Disturbance
2. Impatience
3. Disrespect - Defiance
4. External Blame
5. Achievement Anxiety
6. External Reliance
7. Comprehension

8. Inattentive-Withdrawn

9. Irrelevant-Responsiveness

10. Creative-Initiative

11. Need for Closeness to Teacher

Three additional items are included in the scale which were found to be highly related to achievement, but which were not subsumed under the above categories. The additional items are (a) difficulty in changing from one task to another, (b) quitting in the face of difficulty, and (c) slowness in completing work (1967, p. 19).

The original goal of Spivack and Levine (1964) was to devise items to cover the full range of observable behavior of atypical children, in order to understand and focus on problem behavior. The emphasis of the studies has gradually moved from disturbed and special class children to children in regular classrooms.

Swift and Spivack (1967) stressed the importance of measuring observable behavior of individuals at a specific time rather than over an extended period of time, yet theystated that their norms are valid throughout kindergarten to grade six. This seems to imply that behavior does not change. De Hirsch (1966) has also noted the consistency of her subject's approach to learning and the continuity of behavioral style. This may be so. However, Athey and Holmes (1969) indicated that both reading achievement and behavior can and does change. Similarly Spivack and Swift (1968) indicated that a number of the behavior factors measured by the DESB including external reliance, need for closeness to the teacher, and externaliz-

ation of blame all decrease with an increase in age. They also reported that achievement anxiety is much more highly related to poor academic performance in the higher grades. Therefore, because these behaviors do change with age, it appears that the same norms for all grades would not necessarily be valid, but would be dependent on the degree of change.

Five extensive aims were listed by Spivack and Swift (1968), one of which was "to relate scores to achievement scores across all grades and within each grade (p. 138)." Unfortunately, achievement referred to by Spivack and Swift was not consistent in their studies. The achievement of the subjects varied from a score on the Iowa Test of Basic Skills, to teacher ratings in reading and arithmetic, to teacher ratings in language arts, to a combination of I.Q. and report card grades. In the 1972 study comparing American and French children, there was no mention of how the achievement score was determined. Although the achievement measures were not consistent, Swift and Spivack (1968) reported that the eleven behavior factors and the three additional items of the final DESB scale are significantly related to academic achievement.

Swift and Spivack also investigated differences between the achievement and behavior of males and females. Their findings agree with those of the previously cited studies and indicate that the achievement of boys was lower than that of girls and that on nine of the eleven behavioral factors measured throughout elementary school, boys presented more behavioral problems than girls.

Conclusions Based on these Studies

Most investigators when attempting to survey the relationship between reading achievement and social behavior have not used systematic objective procedures to measure social behavior nor have they employed statistical techniques to their research, but have merely referred to the presence of some form of negative social behavior. However, the literature referred to has made clear the importance of taking into consideration the possibility of interrelationships existing between social behavior and reading ability. This does not mean that a child exhibiting negative social behavior is always a poor reader. Gates (1941), Stewart (1950) and Bond and Tinker (1957) have all reported cases of children with behavioral problems who are excellent readers.

II. LEARNING STRATEGIES OR STYLES AND READING ACHIEVEMENT

A necessary prerequisite for success in reading is the ability to learn and to remember words. Aukerman (1971) has identified about one hundred different approaches to beginning reading which are presently available for teaching children to learn and to remember words. It is assumed that children learn differently when taught by different methods and the proponents of the various methods have generally indicated the superiority of their method.

The four main approaches which will be briefly summarized include: (a) Phonics (b) Spelling Patterns (c) Word families and (d) Modified alphabets, for example, Initial Teaching Alphabet (ITA).

Phonic Approaches

Harris and Sipay (1971) indicate that phonic programs place emphasis on the decoding process which is translating printed forms into their spoken counterparts. Phonic programs differ on important points such as whether instruction begins with consonants or vowels or a combination; whether long or short vowel sounds are introduced first; which rules should be taught; and how and when to introduce meaningful material. The phonic method is often considered to be a synthetic method because it begins with the word element or the sound of the letter and gradually advances to the total word. Other phonic methods differ in that attention is paid to the sounds within words, without sounding the words part by part. Often a combination of these approaches is used.

Burke (1973) indicates that phonics is a good method of identifying words for pupils who respond to auditory clues, but this method is not effective for children with auditory losses or auditory discrimination problems.

Spelling Patterns

Venezky and Weir (1966) have analyzed over 20,000 words and from this analysis of the spelling-to-sound correspondences, have discovered more than fifty-two major spelling units in English.

Frank Smith (1971) reports the research findings of Berdinsky, Cronnell, and Koehler of the Southwest Regional Laboratory for Educational Research and Development who identified sixty-nine grapheme units. A grapheme unit is a group of letters whose rela-

tionship to a sound or sounds could not be accounted for by any rule for single letters. Examples included ch, th, ea, oy, ck, qu, and bb. This research also resulted in the finding of 211 distinct spelling to sound correspondences.

Smith (1971) indicates that even fluent readers frequently come across words that are unfamiliar to them. Since words are built up from familiar letter clusters they are easily identified. He further indicates that immediate word identification can occur when there are visual, acoustic and semantic categories or access routes which are available to the reader so that he does not have to "stop to identify individual letters or laboriously to try out alternative sounds (p. 176)." Smith further indicates that mediated word identification could be accomplished by any one or a combination of the three routes.

Venezky and Weir (1966) indicate that most literates form spelling-to-sound generalizations regardless of the methods used in their initial reading instruction which aid them in later word identification. Gibson, Osser and Pick (1963) also found that children in the early stages of reading, read in short units and tend to generalize certain consistent predictions of grapheme-phoneme correspondence in order that units which fit these simple "rules" are more easily read or pronounced. These researchers found that even when children are taught via the whole word method, they begin to perceive regularities of correspondence between the printed and the spoken forms, and transfer these to the reading of unfamiliar items. This generalization process promotes reading efficiency and

could be facilitated by presenting materials in such a way as to enhance the regularities and speed up their incorporation (p. 10).

Word Families or Linguistic Approaches

In his description of the linguistics approaches to reading Aukerman (1971) indicates that reading is viewed by linguistic scientists as the relatively simple process of decoding or putting the sounds which the printed symbols represent back into spoken form.

Leonard Bloomfield is credited with the identification of the various phonemes which are the basic sounds of our language. The linguistic approach to reading which is based on these sounds begins by first presenting a carefully controlled vocabulary of isolated words. The lists of words stress a particular group of sounds of high consistency with regards to spelling. Thus a large number of words containing the "an" spelling are presented followed by another group containing the "at" spelling, and so on.

There are a variety of linguistically oriented reading series on the market. These vary in that some include pictures while others do not; some present only regularly spelled words while others introduce both regular and irregular words; and some present meaningful content while others de-emphasize meaningful content.

ITA

Aukerman (1971) indicates that "A one-to-one sound-symbol approach to beginning reading is one in which one symbol has been

devised to represent one and only one sound of our language (p. 329)." The ITA is such an approach which was originated by Sir James Pitman although Dr. John Downing of the University of London's Institute of Education (and now of the University of Victoria) became its chief spokesman.

The ITA consists of forty-four different symbols which represent the different sounds of the English language and may be used in either an analytic or synthetic system. The basic idea behind this model is that children should use a more reliable alphabet which presents a one-to-one correspondence between letters and sounds until the students have acquired proficiency in it, at which point they switch to the traditional alphabet.

The preceding approaches to teaching word identification have been presented as an introduction to the present study which is concerned with specific learning behaviors, namely learning how to remember words by the first two approaches - phonic and spelling patterns.

Many research studies have been carried out to determine how individuals best learn to identify and remember words. Many of these studies deal with the differences between the learning of highly similar word lists and variable word lists. The definitions of similar and variable word lists vary to include similar words which have a high frequency of occurrence of similar letters some of which have one sound corresponding to one letter while others have high occurrence of similar letters which do not have a one-to-one correspondence with sound.

Experimental Studies in Word Learning

A study carried out by Samuels and Jeffrey (1966) at the University of California was designed to test the relationship between the rate of learning highly similar word lists and variable word lists, as well as the degree of transfer of learning to a test in which the words were presented again, but with a new letter substituted for one of the letters in each word.

The subjects in this study were thirty-six kindergarten children who were divided into three groups, each of which learned a low, medium or high similarity list of nonsense words.

In the training part of the experiment, the subjects were shown the words and told the word to be associated with the letters. Each subject was given twenty repetitions of the list of words, and each correct response was recorded. The investigators did not mention whether the words were presented in serial or random order. In the transfer part of the experiment, the same procedure was followed as for the training part of the experiment, but the method of presentation employed was a combination of eighteen trials in a constant serial order and a random presentation for the subsequent trials, until the subjects gave correct responses to all stimuli in two successive trials.

The results of this study showed that the group learning the high similarity lists required more presentations of the lists before they were mastered than the groups learning low similarity lists. It was also found that those subjects who had learned the high similarity lists did significantly better on the word recog-

nition task than subjects who had the low similarity lists.

The results of this research also indicate that the number of subjects who make identifications on the basis of a single letter increases with dissimilarity of stimuli. Therefore, Samuels and Jeffrey indicated that training that forces attention to each letter is less likely to lead to future reading errors than training which permits the child to identify words on the basis of a single feature. They also suggested that beginning readers be given specific letter training or experience with highly similar words.

It should be noted that although these researchers applied their findings directly to reading, their research was based on an unusual and artificial alphabet consisting of novel graphemes which did have a one-to-one phoneme-grapheme correspondence, and that all of the words in the study consisted of two letters only.

A second study of children's learning ability (McCutcheon and McDowell, 1969) was designed to repeat the Samuels and Jeffrey (1966) study.

McCutcheon and McDowell attempted to find out to what extent intralist similarity affects (1) rate of acquisition, (2) subsequent recognition skills and (3) tendencies toward generalized incorrect responses to other words.

The subjects used in this study were eighty-two kindergarten children who were taught word lists of four letter words. As in the Samuels and Jeffrey study, the subjects were given eighteen serial trials, followed by random order trials until correct responses were

given for all words on two successive trials. The predictions regarding the effect of intralist similarity on children's learning and later word recognition were the same as those of Samuels and Jeffrey in that high similarity impedes rate of initial learning. McDowell and McCutcheon also reported that "learning lists of low similarity leads to incorrect identifications and false generalizations when new but similar words confront the beginning reader (p. 107)."

In an intensive study designed to measure the differences in learning lists of words which had a constant grapheme-to-phoneme correspondence and the learning of variable lists of words which did not have this constant letter to sound correspondence, Levin and Watson (1963) used forty third-grade children as their subjects. In the constant list, a single grapheme stood for a single sound, while the variable list contained either two or three different sounds for the same grapheme.

The results of this study showed that the groups did not differ on a transfer list. It was also found that the subjects acquired the variable lists during the training period with fewer, though not significant errors, but the group whose variable list was preceded by another variable list performed significantly better than the group whose second list was preceded by a constant list. This finding would substantiate Gibson's (1940) hypothesis that positive transfer will occur in situations where the nature of the second task permits discrimination acquired in a previous task. (p. 197).

In their description of this experiment Levin and Watson did not explain, nor show their artificial alphabet, nor did they explain the method of presentation of the lists of words. Therefore, it is not known if the words were presented in the same fashion to both experimental groups, nor if a serial, random, or a combination of the serial and random order of presentation was used. The nature of the word lists varied so that the group first learning the constant word list had no opportunity to transfer their learning to subsequent lists as all letters in the constant list were unique to that list, whereas the group learning the variable lists had the advantage of learning all vowels in both lists.

A recent study carried out at the University of Wisconsin by Powell (1972) attempted to determine the learning behavior of good and poor readers in second grade, in order to discover reasons for the differences in their academic achievement. The subjects were required to learn lists of words which varied in similarity from low to medium to high.

In this study one hundred and twenty second grade children were used as subjects. There were thirty girls and boys in each of the two groups designated as good and poor readers. Although Powell indicated that the 120 subjects were chosen from a total population of 193, on the basis that the good readers were those who scored more than two standard deviations above the mean and that the poor readers scored more than two standard deviations below the mean, this seems highly improbable as approximately sixty-eight percent of the scores would fall within one standard deviation above and below

the mean.

The lists of two letter nonsense words used in this study were composed of Gibson's letter tranformations which were paired with common nouns such as: tree, home, city and street (p. 32). The nature of these words was such that there was no correspondence between the graphemes and the phonemes.

The order of presentation of the words used in this study was a random order presentation. The rate of learning was ascertained by the number of trials required to learn the lists and the number of errors made in the first six learning trials.

Powell's findings indicate that there were no differences in the learning ability of the good and poor readers. She also found that the learning of high similarity lists proved to be harder and less conducive to accuracy in subsequent word recognition than learning the medium and low similarity lists. This finding is in disagreement with the findings of Samuels and Jeffrey (1966) and McCutcheon and McDowell (1969).

The significant finding of the Powell research was that poor readers attend to and use the first letter of a word for word identification as opposed to the good reader's use of more than the initial letter.

Powell indicated that it is possible that the experimental tasks in her study were not reliable for differentiating the learning ability and word recognition ability of good and poor readers. This seems to be a plausible explanation because although English orthography has many irregularities, there is a correspondence between

phonemes and graphemes, but there was no such relationship in the word lists used by Powell, and therefore her learning task bears little relationship to reading.

The results of the experiments which have been summarized tend to vary with the methods, materials and subjects used. For example, serial presentation of word lists as opposed to a random presentation of words to be learned; nonsense words paired with common nouns as opposed to nonsense words paired with nonsense syllables; and word lists with one-to-one correspondences between the phonemes and graphemes as compared to word lists which do not have such correspondences.

The present study will focus on children's ability to identify (pronounce) constant and variable words and to associate these words with pictures. In this study constant words will be words which have the same two letter constant spelling to sound pattern within each word, and the variable words will have different letters in each letter position for each word. Each group of words, however, will be pronounceable.

Although some of the studies cited previously have variable words similar to those of this study, there appears to be no research on children's learning of words which all contain the same constant spelling pattern within each word.

III. SOCIAL BEHAVIOR AND LEARNING BEHAVIOR

The focus of the present study is not so much concerned with social behavior and reading achievement, but more specifically with

social behavior and methods of learning to remember and identify words.

Studies have been carried out on many different groups of individuals such as the mentally retarded and non-retarded children, adults and children, lower class and middle and upper class children in order to find out how these different groups perform on learning tasks. Studies have also been carried out to contrast differences in the presentation of learning tasks to these different groups. It is interesting to note that although researchers have been concerned with poor readers and methods of assisting them, and have also noted and studied the presence of negative social behavior exhibited by poor readers, there does not appear to be any research regarding how different behavioral types perform on learning tasks and whether or not specific teaching techniques are more efficient for the student who exhibits negative social behavior.

Swift and Spivack (1972) indicate that the DESB is considered useful for educators and psychologists for "a baseline and stimulus for the development of teaching strategies to overcome difficulties, and as a means to assess change following program implementation (p. 493)." However, they do not indicate whether specific teaching strategies have been developed.

CHAPTER III

THE EXPERIMENTAL DESIGN

The purpose of this chapter is to describe the design of the study; the sample selected; the experimental and standardized tests used; the pilot study; and the collection and analysis of the data.

I. DESIGN OF THE STUDY

The main purpose of this study was to measure the overt social behavior of grade two children, and to study their learning strategies in a picture and a word identification situation. The subjects' social behavior was determined by having their teachers complete the DESB. On the basis of this rating, two groups were set up, one exhibiting "positive" and one exhibiting "negative" social behaviors.

Each child was taught to identify pictures by associating with the pictures either a constant or a variable word. In addition, each child was asked to pronounce the word before and after the picture identification task.

Reading achievement was assessed by the Neals Analysis of Reading Ability (Form B, 1966).

Other factors considered were I.Q. scores, chronological age and sex.

II. SAMPLE SELECTION

The test population for this study consisted of six grade two classes in three schools assigned to the investigator by the Edmonton Public School Board. The total enrollment in these six classes of grade two children was 166. The schools were all located in southwest Edmonton. Grade two children were chosen so that there would be a sufficient range of reading levels and high and low readers could be differentiated. Furthermore, if relationships were observed between social behavior, methods of learning, and reading achievement, implications for educators to take what preventive action might be necessary would be in order.

As it was felt necessary to limit the sample to those students whose scores on the experimental tasks would not be affected by a low I.Q. the Canadian Cognitive Abilities Test P2/F1 (Thorndike, Hagen, and Lorge, 1970) was administered to the total population of 166 children. Eight students scoring below one standard deviation or sixteen points from the mean of one hundred were excluded from the final sample. There were forty-seven students whose scores were above one standard deviation from the mean. In order to have a range of behavior and reading achievement in the final sample, it was decided that this large group of students should not be excluded from the sample. The I.Q.'s for the final sample ranged from 85 to 142 with a total sample mean of 109.60 and a standard deviation of 14.79.

Each of the six classroom teachers were asked to use the DESB to rate six children considered by the teachers to be good readers

and six children considered to be poor readers, whose I.Q. scores were tabulated to be 84 or above.

As it was thought that visual and auditory difficulties might influence the performance of the children on the learning tasks, the seventy-two children were administered both a visual and an auditory screening test. The Keystone Telebinocular was used to test each child's visual efficiency with both eyes at near point. On the basis of this test, one child was eliminated from the sample and referred for further visual testing. The VASC audiometer was used to assess each child's hearing ability for speech at various degrees of loudness. On the basis of this test, five children were eliminated and referred for further auditory testing.

A total behavioral score was obtained for each individual on the DESB by totaling all negative scores and the inverse of all positive scores rather than using the fourteen separate rating scales. The behavioral scores of the final sample ranged from 72 to 194 with a mean of 125.58 and a standard deviation of 37.17. The subjects for the positive behavior group were those whose DESB score was 112 or less, and the subjects for the negative behavior group were those whose score was 138 or higher. There was a spread of 26 points between the highest scoring subject of the positive group and the lowest scoring subject of the negative group. All subjects whose scores fell between these ranges were eliminated. This left a sample of twenty-four students in the negative group and twenty-nine students in the positive group. A random selection of five students were eliminated from the positive group leaving a final sample of

twenty-four students in each group.

The I.Q. scores for the negative group ranged from 86 to 142 with a mean of 106.58 and a standard deviation of 14.96. The positive group's scores ranged from 85 to 129 with a mean of 112.62 and a standard deviation of 14.31. Although the mean score for the positive group was higher than that of the negative group, a t test to ensure the equivalence of the two groups was then run. The results as seen in Table II indicate that the two groups did not differ significantly.

TABLE II

t TEST - DIFFERENCE BETWEEN MEANS OF INDEPENDENT SAMPLES

	Mean	Standard Deviation	Value for t
Negative Group	106.58	14.96	-1.43
Positive Group	112.62	14.31	

No attempt was made to balance the sexes in the selection of the sample, as it was felt more important to have behavioral differences. However, the final sample consisted of twelve boys and twelve girls in each of the negative and positive behavior groups.

III. TEST INSTRUMENTS

Standardized Tests

(1) The Keystone Visual Survey Test

This is a visual screening device produced by the Keystone

View Company of Meadville, Pennsylvania, U.S.A. This test involves the use of the Keystone Telebinocular instrument and is individually administered. This instrument is designed to assess an individual's visual ability in a number of areas, such as: acuity at near and far point, phoria at near and far point, fusion, depth perception, and color blindness. The total test consists of 14 subtests, nine of which are placed at the far point position which is equivalent to a distance of twenty feet, and five are placed at the near point position which is equivalent to a distance of sixteen inches.

In the present study it was imperative that the subjects be able to see adequately with both eyes at near point. Therefore, test 12 Usable Vision Both Eyes (Near Point) was administered to each subject to screen out children experiencing visual deficiencies in this area.

(2) V A S C Audiometer

This machine is designed to assess a person's hearing ability for speech at various degrees of loudness.

The VASC Audiometer has been designed for children in the primary grades. Each child is provided with a set of ear phones and a picture response chart. The child is required to respond to auditory instructions by pointing to the correct picture on his picture response chart.

The test is scored during its administration which requires approximately ten to fifteen minutes.

(3) The Canadian Cognitive Abilities Test P2/F1 (1970)

This is a group test designed to reveal the full range of individual differences of children in grades 2 and 3. The test which uses pictorial materials and oral instructions provides information on the development of generalized thinking skills which are necessary for mastery of a wide variety of instructional material.

At the Primary II level there are four short subtests, which measure the following specific areas of cognitive skills: (Thorndike et al 1970, p. 4)

1. The ability to label or name objects or actions or to identify objects when given their use.
2. The ability to identify size, position and quantity.
3. The ability to see relationships and to categorize or classify objects.
4. The ability to deal with quantitative relationships and concepts.

Scores provided include deviation I.Q.'s, where the average I.Q. for each grade has been set at 100 and the standard deviation has been set at 16. Tables of percentile ranks and stanine equivalents of the scores are also provided.

Reviews (Buros, 1972) have indicated that the test is a well constructed and standardized test with excellent reliability, but that validity data are very limited.

(4) The Devereux Elementary School Behavior Rating Scale (1967)

This is a behavior rating scale consisting of 47 different items. It is intended for use by elementary school teachers, and is oriented toward those overt behaviors which "interfere with the successful academic performance of the child (Spivack and Swift, 1967(b) p. 1)." The classroom teacher rates the behavior of her students either on the basis of frequency of occurence, or on the degree of behavior displayed.

The forty-seven behaviors measured by the DESB define eleven different behavior factors containing three, four or five items each, and three additional items. The total scale therefore, is a collection of fourteen separate rating scales.

Reviews (Buros, 1972) have indicated that a major strength of the DESB is the care with which the items were selected and grouped into the rating scale. A test-retest method of establishing a reliability of .87 was used. Although the content validity was compelling, the lack of an explicit treatment of validity is a major flaw in the scale. Lack of sound validity appears to be a general weakness of behavior scales. See Appendix G for a copy of the test.

(5) The Neale Analysis of Reading Ability (Form B, 1966)

This test is easily and quickly administered and assesses achievement in reading accuracy, comprehension and rate. The latter was not considered necessary to the study and was not assessed.

This test consists of six graded passages of prose which form

a continuous reading scale for children from six to twelve years of age. It is administered individually and takes about ten to fifteen minutes.

Reviews (Buros, 1968) have indicated reliability of the accuracy scores to exceed .96 while the reliabilities for the comprehension scores are lower but adequate. The concomitant validity was found to be high.

IV. MATERIALS CONSTRUCTED FOR THE STUDY

Two lists of nonsense words were constructed. One list contained words which contain a common spelling pattern, whereas the second list does not have any common spelling patterns and were termed variable words. It was important that the individual words in the lists should not be differentially difficult, so were chosen in the following manner.

Constant Words

An examination of the single letter and digram frequency tables of Mayzner and Tresselt (1965) indicated that the letter combination "in" occured more frequently than any other digram in all the different letter positions of six letter words,* thus the letter combination "in" was chosen as the constant spelling to sound combination for the list of constant words. Five words were then constructed using "in" in each of the five possible letter positions for six letter word.

*Six letter words were chosen as it was felt that grade two children would encounter a fair amount of difficulty with their pronounciation and that they would not be expected to pronounce these words prior to the experimental tasks.

The five constant words were then broken into syllables and the frequency counts of the syllables with their letter sequences, were determined by using the frequency tables of Mayzner and Tressélt (1965 a, b, c). There were no words in which "in" occurred as the first and second letters in the last syllable and where "in" occurred in the middle position of the word. Therefore, the frequencies were determined for "in" and the word parts before and after the occurrence of "in".

Variable Words

The five variable words were then constructed by using syllables or word parts as in the two exceptions, of similar frequency counts as those for the corresponding constant words. It was also decided that the variable words would have different letters in each letter position for each word. Thus, all letters in the first position of each word were different from all other letters in the first position of the other variable words, and all second letters of each word were different from all other letters in the second position of the other variable words. Similarly all other letters differed from each other in the same letter position. Appendix A includes both the constant and the variable words and their corresponding frequency counts.

Picture Identification Task

Each constant and variable word was paired with a neutral picture (that is, a picture without specific meaning). Appendix B includes the neutral pictures with their corresponding constant and variable words. The pictures were attached to five by eight inch

cards with the words typed under the pictures in primary type.

Each card was shown to the subjects and the corresponding words pronounced for them. The subjects were asked to pronounce the word and to try to remember it so that when they were later shown only the picture they would be able to tell the researcher the correct word. After all the constant or variable pictures had been presented in this manner, the cards were shuffled and the words were covered. The subjects were then asked to name the pictures, and if they were correct they were so informed and the word was exposed to them again. If they were incorrect or did not respond within five seconds they were shown the word which was again pronounced for them. This procedure was repeated until the subject was able to identify all four cards correctly or for a maximum of ten trials. Complete instructions for this task are given in Appendix C.

Word Identification Tasks

The constant and variable words were substituted for nouns in passage one of the Gilmore Oral Reading Test forms C and D for the pre test reading passages. The subjects were asked to read the passage which was typed with primary type on five by eight inch cards. The subjects were informed that some words which did not have any meaning were in the passage and that the researcher wanted to find out if they could read them. The pre-test was administered prior to the picture identification task. The pre-tests are included in Appendix D.

The post test reading passages were constructed by substituting the variable and constant words for nouns in passage one of forms A and D of the Gray Oral Reading Test. The post-tests were administered following the picture identification tasks. The post-tests have been included in Appendix E.

IV. PILOT STUDY

A pilot study using six grade two children divided equally into negative and positive behavior groups on the basis of their teachers' ratings, was conducted early in February 1972. The purpose of the pilot study was to gain further information with regard to the following areas: (a) to determine if the teacher ratings on the DESB would yield a total behavioral score which could be used to divide the subjects into negative and positive behavior groups; (b) to determine if the test instructions were adequate for grade two children; (c) to determine if the test words were too difficult for the children to master; (d) to assess the amount of time necessary for the final study.

On the basis of the pilot study, the following information was obtained, and the following decisions were made: (a) The nonsense words were changed so that they would be chosen according to the procedure previously outlined. (See page 40). (b) The DESB deviant scores were recorded for each of the fourteen separate factors and a total behavioral score was also calculated for each student. The results of these calculations can be seen in Table III.

TABLE III

PILOT STUDY BEHAVIOR RATINGS

	Total Scores	Deviant Scores
Positive Social Behavior Group	102	1
	108	1
	120	1
Negative Social Behavior Group	152	5
	163	5
	183	9

After comparing the two different behavior scores, it was decided that a total behavior score would adequately divide the subjects into two behavioral groups. (c) There appeared to be differences in the learning of the two types of words by the different groups of children. (d) Some children appeared to be able to pronounce the test words when first exposed to them. Therefore, it was decided that a pre-test should be given to all subjects in the final study to determine the number of words that each subject was able to pronounce prior to the experimental task. (e) The children encountered no apparent difficulties with the test instructions. (f) The total time involved in the administration of the experimental task varied from ten to twenty minutes per child. (g) It was decided that a time limit of five seconds would be used for the pictures and word identification in the study. Thus, if a student did not give the correct response within five seconds, he would not be given credit for identifying that particular word or picture.

V. COLLECTION OF DATA

The Canadian Cognitive Abilities Test was administered to each of the six grade two classes by their regular class teacher who was assisted by the researcher or another staff member within the school. The testing was conducted during regular class time on two different occasions, and rest intervals were given to the students during each of these sessions.

A trained assistant aided the researcher in the administration of the visual and auditory screening tests and the oral reading test. All of the visual screening tests were individually administered to the subjects and required approximately three to five minutes for their administration. The VASC auditory screening tests were administered to two subjects at one time. Each subject had a set of ear phones and his own picture response chart and was seated so that he was unable to see the responses of the other subject being tested. The time required for this testing was approximately ten to fifteen minutes. The Neale Analysis of Reading Ability was also individually administered. This testing required approximately five to fifteen minutes depending on the reading ability of the subject. The auditory, visual and reading tests were administered to the seventy-two children who had been chosen by their teachers as good and poor readers.

The final group of forty-eight subjects who were classified as exhibiting either positive or negative social behavior were given a word identification pre-test, a picture identification test,

and a word identification post-test. The instructions and procedures followed by the researcher are included in Appendix C. Each child was tested individually during class time in a private room. This testing took approximately fifteen to twenty minutes per child.

VI. ANALYSIS OF DATA

The data for this study were analyzed according to the following statistical procedures:

(1) t - Test

A t Test was used to determine if there were significant differences in the I.Q. scores of the positive and negative social behavior groups.

(2) Two Way Analysis of Variance (ANOV 22)

This two way analysis of variance was used to determine whether differences existed between the behavioral groups and the sexes on reading accuracy, reading comprehension, picture identification of constant words, and picture identification of variable words.

(3) Analysis of Covariance (ANCV 10)

This statistical test was used to determine the differences between the means of the two groups on word identification for the post-test with word identification on the pre test and picture identification or number of trials covaried out.

(4) Correlated t - Test (ANOV 12)

This correlated t Test was used to test the differences

between means and variances for both the negative and positive groups for word identification of:

(a) Constant words (pre-test) vs variable words (pre-test)

(b) Constant words (post-test) vs variable words (post-test)

(5) Pearson Product Moment Correlation (DEST 02)

This procedure was used to determine if a linear relationship existed:

(a) between all variables for the total sample

(b) between all variables for the positive group

(c) between all variables for the negative group

(d) between all variables for the females in the positive group

(e) between all variables for the males in the positive group

(f) between all variables for the females in the negative group

(g) between all variables for the males in the negative group

CHAPTER IV

ANALYSIS AND INTERPRETATION OF TEST DATA

The purpose of this chapter is to present and discuss the analysis of the test results under the following headings:

I. Reading achievement of negative and positive behavior children by sex.

II. Picture Identification and positive and negative behavior children.

III. Constant versus variable picture identification tasks for positive and negative behavior children.

IV. Word identification and positive and negative behavior children.

V. Constant versus variable word identification tasks for positive and negative behavior children.

VI. Picture and word identification and related variables

1. Sex
2. I.Q. and chronological age
3. Reading accuracy and reading comprehension

I. READING ACHIEVEMENT OF NEGATIVE AND POSITIVE BEHAVIOR CHILDREN

The subjects were divided according to their behavioral ratings on the DESB into groups of positive social behavior and negative social behavior. Table IV outlines the mean scores and

standard deviations for each of these groups on the reading accuracy and reading comprehension tests. The results indicate that the positive social behavior group attained the highest scores on both the reading accuracy and comprehension tests. The mean raw score of 27.50 for the negative group for reading accuracy is equivalent to the reading age of 7.11, and the mean raw scores of 44.96 for the positive group is equivalent to the reading age of 9.1. There is thus, a difference of over one year between the groups on their reading accuracy grade scores. The mean raw scores for comprehension for the negative and positive groups were 10.75 and 16.50 which are equivalent to reading ages of 8.1 for the negative group and 9.0 for the positive group. Again, there is almost one year difference in the reading ages of the two groups. The mean score for chronological age of the negative group was 7.5 years, while that of the positive group was 7.6 years.

The summaries of analysis of variance Tables V and VI indicate that the groups are statistically different at the .01 level with regards to their scores on both reading accuracy and reading comprehension. Thus the results of this study confirm the findings of such studies as Malmquist (1958), Glick (1972) and Swift and Spivack (1968, 1972) that there is a significant relationship between social behavior and reading achievement.

Although behavior groups differed significantly in reading achievement scores there is no significant difference between the reading achievement of the sexes nor is there a significant interaction between sex and behavior group. As previously indicated, the

TABLE IV

MEANS AND STANDARD DEVIATIONS FOR READING ACHIEVEMENT OF NEGATIVE AND POSITIVE BEHAVIOR CHILDREN BY SEX

Negative Group	Reading Accuracy	Reading Comprehension	N
Females	$\bar{X}$ 28.25 S.D. 7.84	$\bar{X}$ 10.08 S.D. 4.10	12
Males	$\bar{X}$ 26.75 S.D. 8.14	$\bar{X}$ 11.42 S.D. 2.97	12
Total	$\bar{X}$ 27.50 S.D. 7.69	$\bar{X}$ 10.75 S.D. 3.49	24

Positive Group	Reading Accuracy	Reading Comprehension	N
Females	$\bar{X}$ 46.92 S.D. 16.27	$\bar{X}$ 18.42 S.D. 8.33	12
Males	$\bar{X}$ 43.00 S.D. 14.44	$\bar{X}$ 14.58 S.D. 5.35	12
Total	$\bar{X}$ 44.96 S.D. 14.86	$\bar{X}$ 16.50 S.D. 6.97	24

TABLE V

SUMMARY OF ANALYSIS OF VARIANCE WHEN CONSIDERING SEX, GROUP AND READING ACCURACY

Source of Variation	SS	DF	MS	F
Between groups	3657.50	1	3657.50	24.34 **
Between Sex	88.04	1	88.04	.59
Sex X Group	17.52	1	17.52	.12
Error	6611.44	44	150.26	

** Significant at .01 level

TABLE VI

SUMMARY OF ANALYSIS OF VARIANCE WHEN CONSIDERING SEX, GROUP AND READING COMPREHENSION

Source of Variation	SS	DF	MS	F
Between Groups	396.75	1	396.75	12.84 **
Between Sex	18.75	1	18.75	.61
Sex X Group	80.08	1	80.08	2.59
Error	1359.67	44	30.90	

** Significant at .01 level

groups are not different with regards to I.Q. This lack of any significant difference between the reading achievement of the boys and girls is not consistent with many reading researchers such as Hunter and Johnson (1971), De Hirsch, Jansky and Lanford (1966), Malmquist (1958) and Robinson (1946) who all report a much larger percentage of boys with reading problems.

As Table VII indicates, the correlations for the total sample between behavior rating score and reading scores are statistically significant at the .01 level, as are the scores for the positive group. The correlations are negative thus indicating that individuals with low behavior scores (which represent the positive behavior group) tend to have high reading scores. The negative group's scores, however, indicate a different type of relationship. While the overall negative group has low negative correlations between behavior scores and reading scores, the males in this group do not follow this pattern.

The results of the statistical tests on reading achievement and behavior indicate that there is a pronounced difference in the reading achievement of the two behavior groups and that social behavior appears to be a very good predictor of a child's success in reading.

TABLE VII

CORRELATIONS BETWEEN BEHAVIOR RATING

AND READING SCORES

Negative Group	Reading Accuracy	Reading Comprehension
Females	-.32	-.27
Males	.16	.22
Total	-.05	-.04

Positive Group	Reading Accuracy	Reading Comprehension
Females	-.74 **	-.69 **
Males	-.50	-.70 **
Total	-.62 **	-.63 **

Total Group	-.66 **	-.56 **

** Significant at .01 level

II. PICTURE IDENTIFICATION

OF POSITIVE AND NEGATIVE BEHAVIOR CHILDREN

The score for picture identification consisted of the number of trials necessary for the subject to correctly identify all four pictures consecutively without the corresponding word being exposed to him, or to a maximum of ten trials. Thus, a subject who was able to learn quickly to match the picture with the correct verbal response received a low score, while the child who was unable to perform this task within ten trials would receive a maximum score of ten.

The group of negative behavior children attained scores which varied from a low of four to a high of ten, while the positive group varied from a low score of one to a high of ten. The means for the two groups on picture identification of constant and variable words are illustrated in Table VIII. The negative group attained a mean of 8.67 for constant picture identification, while the positive group attained a mean of 5.79. The means for picture identification of variable words varied from 8.88 for the negative group to 6.67 for the positive group. The positive group were definitely superior to the negative group on both of these picture identification tasks.

Fifteen of the twenty-four negative children required ten trials for picture identification of constant words, while four of the twenty-four positive children required ten trials. On the picture identification task for variable words, seventeen of the

TABLE VIII

MEANS AND STANDARD DEVIATIONS OF PICTURE IDENTIFICATION FOR POSITIVE AND NEGATIVE BEHAVIOR GROUPS

Behavior Groups		Picture Identification		
		Constant Words	Variable Words	Total Words
Negative group	$\bar{X}$	8.67	8.88	17.54
	S.D.	2.06	1.92	3.66
Positive group	$\bar{X}$	5.79	6.67	12.46
	S.D.	2.84	2.75	4.88

negative group required ten trials, while only seven of the positive group required ten trials.

Since the maximum number of trials for picture identification was ten, it was not known whether the children who had completed all ten trials had actually learned to identify the pictures.

The summary of analysis of variance for picture identification of constant words (Table IX) and picture identification of variable words (Table X) clearly indicates the superiority of the positive group to that of the negative group. The difference between the two groups is statistically significant at the .01 level. Although the performance of the two groups is very different, as it is for reading achievement, there is again no difference between the two sexes on picture identification of either constant or variable words, nor is the interaction between the groups and the sex of the children of statistical significance.

Not only do children who are rated as exhibiting positive behavior by their teachers, score higher on reading achievement tasks, but they also appear to be able to learn faster in a picture word association task and regardless of whether the words are of a constant or variable nature. This raises a number of questions about the possibility of negative social behaviors acting as an interfering factor in a child's learning performance.

TABLE IX

SUMMARY OF ANALYSIS OF VARIANCE WHEN CONSIDERING PICTURE IDENTIFICATION OF CONSTANT WORDS FOR POSITIVE AND NEGATIVE GROUPS AND FOR BOTH SEXES

Source of Variation	SS	DF	MS	F
Between Groups	99.19	1	99.19	14.81 **
Between Sexes	.52	1	.52	.08
Sex X Group	.02	1	.02	.00
Error	294.75	44	6.70	

** Significant at .01 level

TABLE X

SUMMARY OF ANALYSIS OF VARIANCE WHEN CONSIDERING PICTURE IDENTIFICATION OF VARIABLE WORDS FOR BOTH GROUPS AND BOTH SEXES

Source of Variation	SS	DF	MS	F
Between Groups	58.52	1	58.52	9.58 **
Between Sexes	1.02	1	1.02	.17
Sex X Group	.19	1	.19	.03
Error	268.75	44	6.11	

** Significant at .01 level

III. CONSTANT VERSUS VARIABLE PICTURE IDENTIFICATION TASKS FOR POSITIVE AND NEGATIVE BEHAVIOR CHILDREN

A correlated t Test was used in order to determine if the learning behavior of the two social behavior groups differed with regards to learning constant or variable words.

The data are shown in Table XI and indicate that there are no significant differences between either the variances or the means for either of the two groups on picture identification of constant versus variable words.

As previously illustrated in Table III, both behavior groups required fewer trials to master the constant picture identification task than was necessary for the variable picture identification task. The constant words appeared easier for both groups, although there were no statistically significant differences for either group. It is possible, however, that a statistical significant difference might have been apparent if there had been a larger number of both variable and constant words in the experimental task.

The Pearson Product Moment Correlations which are illustrated in Table XII for behavior rating and picture identification of constant and variable words indicate that the correlations for the constant words are significant at the .05 level for both the positive and negative behavior children as separate groups and at the .01 level for the total sample. For the variable words, the correlations for the total sample are significant at the .01 level. This relationship does not hold for the two behavior groups which have low non-

TABLE XI

SUMMARY OF CORRELATED t-TEST FOR DIFFERENCES BETWEEN MEANS AND VARIANCES OF CONSTANT VERSUS VARIABLE PICTURE IDENTIFICATION TASKS FOR POSITIVE AND NEGATIVE BEHAVIOR CHILDREN

	Picture identification	
	Test of differences between variances	Test of differences between means
Behavior Groups	Constant VS Variable words	Constant VS Variable words
Negative	.44	.64
Positive	.86	1.54

TABLE XII

CORRELATIONS FOR BEHAVIOR RATING AND PICTURE IDENTIFICATION

	Picture Identification		
Behavior Groups	Constant Words	Variable Words	Total Words
Negative	.47 *	.37	.47 *
Positive	.39 *	.21	.35
Total	.61 **	.49 **	.60 **

* Significant at .05 level

** Significant at .01 level

significant correlations. There is, therefore, a much closer relationship between constant words and behavior rating of both behavior groups. This would seem to indicate that the performances of these children on a constant word picture identification task is relative to their classification with respect to social behavior.

IV. WORD IDENTIFICATION OF POSITIVE AND NEGATIVE BEHAVIOR CHILDREN

The word identification tasks consisted of a pre-test of four constant and four variable nonsense words, each group embedded in short reading passages of comparable difficulty, and a post-test of the same four constant and variable words which were part of reading passages also of comparable difficulty (see Chapter III for construction of the tests). One passage was given to the children at the beginning of the experiment and from this administration was derived a set of pre-scores. Then the picture identification task (using the same words as for the word identification situation) intervened and the children were then tested for their pronunciation of words in the second reading passage which yielded a set of post-scores.

Table XIII illustrates the means and standard deviations of both groups for word identification of constant and variable words. The performance of the positive group was again superior to that of the negative group on all four word identification tasks.

TABLE XIII

MEANS AND STANDARD DEVIATIONS FOR WORD IDENTIFICATION FOR POSITIVE AND NEGATIVE BEHAVIOR GROUPS

	Word Identification			
	Constant words		Variable Words	
Groups	Pre Test	Post Test	Pre Test	Post Test
Negative group	$\bar{X}$ .79	3.04	.71	2.88
	S.D. 1.12	1.06	1.14	1.09
Positive Group	$\bar{X}$ 1.96	3.58	1.75	3.71
	S.D. 1.49	.64	1.36	.45

An analysis of covariance was used in order to determine if there were significant differences between the groups on post-test word identification after the number of trials and the pre-test scores were partialled out. Tables XIV and XV show that there were no significant differences between the groups for the analysis of covariance for either the constant or the variable words. The explanation for this lack of difference is that the two groups differed significantly at the .01 level of significance on the number of trials (picture identification) and on the pre-test scores for both constant and variable words. The post-test scores were also significantly different ($p < .05$ for constant words and $p < .01$ for variable words). Therefore, when these differences were removed in the analysis of covariance on the post-test scores, all the differences that had existed between the groups had been removed. It is important to point out, however, that the standard deviations (Table XIII) of post-test scores for both constant and variable word learning for the positive group were much smaller than their standard deviation scores for the pre-tests and smaller than the standard deviation scores of the post-test of the negative behavior group. This would indicate that more learning took place within the positive behavior group on both types of words, as opposed to the negative behavior group.

TABLE XIV

SUMMARY OF ANALYSIS OF VARIANCE BETWEEN THE GROUPS FOR NUMBER OF TRIALS, PRE-TEST SCORES AND POST-TEST SCORES FOR CONSTANT WORDS, AND ANALYSIS OF COVARIANCE OF POST-TEST SCORES WITH THE NUMBER OF TRIALS AND THE PRE-TEST SCORES PARTIALLED OUT

Variable	Source of Variance	DF	MS	F
Number of Trials	Between Groups	1	99.19	15.45 **
Pre-Test Scores	Between Groups	1	16.33	9.06 **
Post-Test Scores	Between Groups	1	3.52	4.40 *
Post-Test Scores, with number of trials and pre-test scores partialled out	Between Groups	1	.08	.13

* Significant at the .05 level

** Significant at the .01 level

TABLE XV

SUMMARY OF ANALYSIS OF VARIANCE BETWEEN THE GROUPS FOR NUMBER OF TRIALS, PRE-TEST SCORES AND POST-TEST SCORES FOR VARIABLE WORDS, AND ANALYSIS OF COVARIANCE OF POST-TEST SCORES WITH THE NUMBER OF TRIALS AND THE PRE-TEST SCORES PARTIALLED OUT

Variable	Source of Variance	DF	MS	F
Number of Trials	Between Groups	1	58.52	9.97 **
Pre-Test Scores	Between Groups	1	13.02	7.94 **
Post-Test Scores	Between Groups	1	8.33	11.71 **
Post-Test Scores with Number of Trials and Pre-Test Scores Partialled out	Between Groups	1	2.06	3.35

** Significant at the .01 level

V. CONSTANT VERSUS VARIABLE WORD IDENTIFICATION TASKS FOR POSITIVE AND NEGATIVE BEHAVIOR CHILDREN

The positive group scored slightly higher on their pre-test for constant words with a mean of 1.96 as compared to a mean of 1.75 for variable words, yet scored slightly higher on their identification of variable words on their post-tests with a mean of 3.71 as compared to a mean of 3.58 for constant words.

Although the means for the negative group were lower on all four word identification tasks, the negative group performed better on the constant words on both of the pre and post-tests.

The learning behavior of each group was again analyzed by means of a correlated t Test to determine if the groups were better able to learn either constant or variable words. Table XVI presents the data obtained from the correlated t Test for differences between constant and variable words for both pre and post-test scores. The results of this analysis indicate that there were no significant differences for either type of word identification for either of the two groups. On word identification, as on picture identification the negative group performed slightly better on constant words on both their pre and post-tests. The positive group's performance was superior for constant words on the pre-test, but slightly better on the variable words for the post-test. However, it must be remembered that only four words of each type (constant and variable) were used and this may not have been a sufficient number to indicate significant differ-

ences. Furthermore, whereas the constant part of the word was pointed out at the beginning of the task, no attention was drawn to this unit on subsequent trials. Thus more direct teaching may also have been necessary to produce differences in results.

TABLE XVI

SUMMARY OF CORRELATED t-TEST FOR DIFFERENCES BETWEEN CONSTANT AND VARIABLE WORD IDENTIFICATION FOR POSITIVE AND NEGATIVE GROUPS

	Word Identification	
	t Test values for means of pre-test scores	t Test values for means of post-test scores
Behavior Groups	Constant VS Variable	Constant VS Variable
Negative	.62	.81
Positive	.84	-.83

VI. PICTURE AND WORD IDENTIFICATION AND RELATED VARIABLES

The present section will consider the relationship of word and picture identification to the variables of sex, I.Q., chronological age, reading accuracy and reading comprehension.

Sex and Picture Identification

The data of Table XVII indicate that boys and girls did not perform differently on picture identification of either constant or

variable words.

Similarly as previously indicated (Tables V and VI) there were no significant differences between the reading accuracy and reading comprehension scores of the boys and the girls.

The correlations between DESB rating and picture and word identification for boys and girls are illustrated in Table XVIII. The results indicate that there was no significant relationship between behavioral ratings of boys and girls and their scores on the picture identification test.

The correlations for word identification of constant and variable words and DESB scores show a somewhat different and inconsistent pattern. The correlations for the group of positive girls are significant at the .05 level or higher for three of the word identification tasks, thus indicating that their learning strategies are closely related to their behavior scores. However the only other significant correlation is that for the negative girls on pre-test scores for constant words.

Chronological Age, I.Q., and Word and Picture Identification

It was of interest to find out if intelligence and chronological age would have significant correlations with word and picture identification scores. The subjects in the study were all grade two children with ages ranging from 81 to 99 months. The mean age for the total group being 91.04 months. Although there was a spread of eighteen months in the ages of the subjects, Tables XIX, XX and XXI all indicate the non significant low correlations

TABLE XVII

SUMMARY OF ANALYSIS OF VARIANCE WHEN CONSIDERING PICTURE IDENTIFICATION OF CONSTANT WORDS AND VARIABLE WORDS FOR BOTH SEXES

1. Constant Words

Source of Variation	SS	DF	MS	F
Between Sexes	.52	1	.52	.08
Sex X Group	.02	1	.02	.00

2. Variable Words

Source of Variation	SS	DF	MS	F
Between Sexes	1.02	1	1.02	.17
Sex X Group	.19	1	.19	.03

TABLE XVIII

CORRELATIONS BETWEEN BEHAVIOR SCORES AND PICTURE AND WORD IDENTIFICATION FOR BOYS AND GIRLS

	Picture Identification		Word Identification			
	Constant Words	Variable Words	Constant Pre	Constant Post	Variable Pre	Variable Post
Negative girls	.45	.52	-.60 *	-.15	-.38	-.19
Negative boys	.51	.27	-.09	.45	-.02	.30
Positive girls	.35	.02	-.72**	-.55*	-.69**	-.18
Positive boys	.44	.48	-.35	-.29	-.40	-.49

* Significant at .05 level

** Significant at .01 level

for chronological age and scores on picture and word identification tasks.

To assess intelligence, scores from the Canadian Cognitive Abilities Test were used. These scores were then correlated with the picture and word identification tasks. The results of these correlations are illustrated in Tables XIX, XX and XXI. It is interesting to note that there are high correlations for picture identification and I.Q. which are statistically significant at the .05 level or higher for the positive group, the negative group and the total sample.

The same type of relationship does not hold for the word identification tasks. Table XX and XXI illustrate the fact that although there are significant correlations for the total sample for I.Q. and pre and post-test word identification tasks, these relationships are not significant when the sample is divided into positive and negative behavior groups. The word identification tasks were embedded in reading passages, thus this type of task may have required less intellectual ability than the picture-word association type task by which picture identification was measured.

To ensure that the differences in the performances of the groups on picture and word identification tasks was not the result of differences in I.Q., an analysis of covariance was carried out. The results of this analysis are illustrated in Appendix F and indicate that the performance of the groups was still significantly different (at the .01 level), after the I.Q. scores had been partialled out.

TABLE XIX

CORRELATIONS BETWEEN PICTURE IDENTIFICATION, IQ, AND CHRONOLOGICAL AGE

	CONSTANT WORDS		VARIABLE WORDS	
Groups	I.Q.	C.A.	I.Q.	C.A.
Negative	-.51 **	.31	-.50 **	-.08
Positive	-.42 *	.10	-.43 **	.21
Total group	-.48	.06	-.49	-.03

* Significant at .05 level

** Significant at .01 level

TABLE XX

CORRELATIONS FOR PRE AND POST-TEST WORD IDENTIFICATION OF CONSTANT WORDS AND I.Q., AND CHRONOLOGICAL AGE

Groups	I.Q.		C.A.	
	Pre Test	Post Test	Pre Test	Post Test
Negative	.32	.39	.08	-.39
Positive	.45 *	.25	-.21	-.06
Total Sample	.53 **	.37 **	.03	-.21

* Significant at .05 level

** Significant at .01 level

TABLE XXI

CORRELATIONS FOR PRE AND POST-TEST WORD IDENTIFICATION OF VARIABLE WORDS AND I.Q., AND CHRONOLOGICAL AGE

Groups	I.Q.		C.A.	
	Pre Test	Post Test	Pre Test	Post Test
Negative	.26	.34	-.12	-.18
Positive	.37	.11	-.22	.12
Total Sample	.37 **	.32 *	-.07	.00

* Significant at .05 level

** Significant at .01 level

Reading Accuracy and Picture and Word Identification

The correlations for reading accuracy and picture and word identification for the total sample are significant at the .01 level for all six identification tasks. A breakdown of the total sample into four sub groups of negative females and males, and positive females and males yields a slightly different picture. The data which are illustrated in Table XXII indicate that the negative group who have lower reading achievement scores have high correlations on the picture and word identification tasks. Therefore, the learning behaviors of these children seems to be consistent with regards to reading accuracy and picture and word identification. It is interesting to note that the highest correlations for post-test scores of the word identification task were for constant words for girls and for variable words for boys. Perhaps one must not only dichotomize negative and positive social behavior groups of children in looking for different learning patterns in identifying words, but must also look for possible differences between the sexes of these groups.

The positive group however, have high significant correlations with the constant words on the pre and post-tests and the variable words on the pre-test. The correlations for the variable words post-test and the picture identification tasks are not significant for this group. It appears that the positive group employ different learning techniques on the word identification

tasks. It also appears that greater facility in coping with words with a constant spelling pattern has a high relationship to reading (pronouncing) words in a standard reading passage.

The results of Table XXII also indicate very obviously that the ability to pronounce words is much more related to success in reading accuracy than is the ability to associate words with pictures.

TABLE XXII

CORRELATIONS BETWEEN READING ACCURACY AND PICTURE AND WORD IDENTIFICATION

	Picture Identification			Word Identification			
				Constant Words		Variable Words	
	Constant Words	Variable Words	Total	Pre-Test	Post-Test	Pre-Test	Post-Test
Negative females	-.71 **	-.58 *	-.68 **	.59 **	.90 **	.71 **	.63 *
Negative males	-.19	-.64 *	-.48	.79 **	.62 *	.76 **	.73 **
Total negative group	-.47 *	-.62 **	-.59 **	.69 **	.72 **	.70 **	.69 **
Positive females	-.56 *	-.24	-.46	.68 **	.75 **	.87 **	.39
Positive males	-.17	-.36	-.31	.88 **	.68 **	.69 **	.15
Total positive group	-.37	-.29	-.38	.75 **	.71 **	.75 **	.28
Total Sample	-.57 **	-.52 **	-.60 **	.77 **	.64 **	.76 **	.54 **

* Significant at the .05 level

** Significant at the .01 level

Reading Comprehension and Picture and Word Identification

It was hypothesized that the students' reading comprehension scores would correlate more highly with picture identification than with word identification scores. The results of the correlations between reading comprehension and picture and word identification are illustrated in Table XXIII and indicate that this is not so.

The ability to understand reading material and the ability to pronounce or identify unknown words appears to be related as can be seen by the high positive correlations of the positive group which are generally significant for word identification tasks. The positive social behavior group also have higher reading comprehension scores. This leads one to question the relationship between pictures and reading comprehension. It appears from the present study that meaning is mostly carried through words, and word accuracy is a crucial factor in reading comprehension.

TABLE XXIII

CORRELATIONS BETWEEN READING COMPREHENSION AND PICTURE AND WORD IDENTIFICATION

	Picture Identification			Word Identification			
	Constant Words	Variable Words	Total	Constant Words		Variable Words	
				Pre-Test	Post-Test	Pre-Test	Post-Test
Negative females	-.18	-.02	-.12	.15	.40	.04	.34
Negative males	.03	-.35	-.19	.58 *	.49	.61	.46
Total negative group	-.11	-.14	-.14	.34	.45 *	.34	.35
Positive females	-.37	-.29	-.37	.66 **	.64 *	.82 **	.27
Positive males	-.50	-.43	-.54	.59	.46	.73 **	.49
Total positive group	-.38	-.33	-.41	.53 **	.53 **	.68 **	.36

* Significant at .05 level

** Significant at .01 level

VII. SUMMARY OF FINDINGS

The findings resulting from the interpretation of the test data are summarized as follows:

1. The positive behavior group scored significantly higher than the negative group on reading accuracy and reading comprehension.
2. A significant negative relationship exists between the behavior scores of the total group and their reading accuracy and reading comprehension scores.
3. There is a significant difference between the groups on their picture identification of both constant and variable words.
4. There is a significant difference between the groups on their word identification for constant and variable words on both pre and post-test scores.
5. The negative group did not differ in their performance in learning either constant or variable pictures or words. Both groups required fewer trials to master picture identification of constant words, and both groups scored slightly higher on their pre-test word identification of constant words. The negative group continued their trend of performing better with constant words on their post-test scores while the positive group performed slightly better with variable words on their post-test scores.
6. There is no significant difference between the sexes on

reading accuracy, reading comprehension, picture identification and word identification of either constant or variable words.

7. Chronological age did not correlate significantly with word or picture identification.

8. I.Q. correlated significantly with picture identification of both constant and variable words, but did not correlate significantly for the two behavior groups with word identification for either pre or post-test scores.

9. The correlations for reading accuracy and picture and word identification for the total sample and the negative group are significant at the .01 level, but the correlations for the positive group are not significant for picture identification.

10. The correlations for reading comprehension and picture and word identification are significant at the .01 level of significance for the total sample and for the positive group for word identification only. There are low correlations for both groups on reading comprehension and picture identification, and inconsistent correlations for the negative group on reading comprehension and word identification.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

I. SUMMARY

The main purpose of this study was to measure the overt social behavior of grade two children and to study the learning styles or strategies of these children with constant and variable words in picture and word identification tasks. Both social behavior and learning styles or strategies for pre and post-test word identification and picture identification tasks of both constant and variable words were related to the children's levels of reading achievement, chronological age, sex, and I.Q. A sample of grade two children were chosen with equal numbers of children exhibiting positive social behavior and negative social behavior according to teacher ratings on the DESB. The total sample involved one group of twelve girls and twelve boys exhibiting negative social behavior and another group of twelve girls and twelve boys exhibiting positive social behavior.

All of the subjects in this study were screened for vision and hearing deficiencies, they were all given a group I.Q. test, a reading achievement test and six experimental tests which were used to determine the learning styles or strategies of the subjects.

II. FINDINGS AND CONCLUSIONS

Hypothesis 1

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) reading accuracy scores on the Neale Analysis of Reading Ability.

(b) reading comprehension scores on the Neale Analysis of Reading Ability.

(a) This hypothesis was rejected since the analysis of variance indicated that the positive and negative groups differed significantly at the .01 level of significance in their reading accuracy scores on the Neale Analysis of Reading Ability test.

(b) This hypothesis was rejected since the analysis of variance indicated that the positive and negative groups differed significantly at the .01 level of significance in their reading comprehension scores on the Neale Analysis of Reading Ability.

Conclusion

The results of the statistical tests on reading achievement and social behavior indicate that there is a pronounced difference in the reading achievement of the two behavior groups and that social behavior appears to be a very good predictor of a child's success in reading.

The test results show that a child's level of reading achievement is related to his social behavior as indicated by

teacher ratings with the DESB. The results would indicate the valid use of the DESB as a predictor of reading success or failure.

Hypothesis 2

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) picture identification of constant words

(b) picture identification of variable words

(a), (b) These hypotheses were rejected since the analysis of variance was significant beyond the .01 level of significance. The two social behavior groups differed significantly on their scores for picture identification of both constant and variable words.

Conclusion

The test results show a similar pattern of difference between the groups for picture identification of both constant and variable words as was found for reading achievement. The two groups differed significantly in the picture identification tasks, thus indicating that there is a close relationship between social behavior and individual learning strategies as exhibited by the scores for picture identification.

Not only do children who are rated as exhibiting positive social behavior score higher on reading achievement tasks, but they also require fewer trials to learn picture-word association tasks for both constant and variable words. It appears possible

that negative social behaviors act as an interfering factor in a child's learning performance.

Hypothesis 3

There is no significant difference between the scores obtained by the positive and negative social behavior groups on:

(a) word identification of constant words for the pre-test

(b) word identification of variable words for the pre-test

(c) word identification of constant words for the post-test

(d) word identification of variable words for the post-test

(a), (b) These hypotheses were rejected. The analysis of variance indicated a significant difference ($p < .01$) between the two social behavior groups on pre-test scores for word identification of both constant and variable words.

(c), (d) These hypotheses were also rejected. The analysis of variance indicated a significant difference ($p < .05$) between the two social behavior groups on post-test scores for word identification of both constant and variable words.

Conclusion

The results of the tests further indicated the difference in the performance of the two behavior groups. The positive group were superior to the negative group on all four word identification tasks. This tends to reinforce the idea that negative behavior possibly tends to inhibit learning as reflected by the lower scores of the negative group on the word identification tasks.

It was of interest to find out if differences would still exist between the groups on post-test word identification scores after the pre-test scores and the number of trials (picture identification) had been covaried out. However, when all of these differences were removed in the analysis of covariance on the post-test scores, all the differences that had existed between the groups had been removed and so there remained no significant differences. This indicates that these groups were different.

The standard-deviations for the positive behavior group, on post-test scores for word identification of both constant and variable words were considerably smaller than the standard deviations in their performance in pronouncing words at the beginning of the experiment, and remained different at the end of the experiment as indicated by the post-test results for the negative group, thus indicating that the positive group exhibited more consistent learning for both types of word identification.

Hypothesis 4

There is no significant difference between the scores obtained by the negative social behavior children on picture identification of constant words and picture identification of variable words. This hypothesis was not rejected.

Conclusion

The results of the correlated t test indicated that there was no significant difference between the scores for picture identification of either constant or variable words for the nega-

ive group. However, the mean scores of the negative group were slightly lower (indicating fewer trials necessary for learning) for picture identification of constant words, and the correlations between behavior scores and picture identification of constant words were significant at the .05 level of significance. This relationship did not hold for variable words. Therefore, it appears that there is a slight indication favoring the learning of constant picture-word association tasks for the negative group. In this study there were only four words of each type, and this may not have been a sufficient number to indicate significant differences.

Hypothesis 5

There is no significant difference between the scores obtained by the negative social behavior children on:

(a) pre-test scores for constant and variable words

(b) post-test scores for constant and variable words

(a), (b) Since no statistical significant differences were found between constant and variable words for the negative group on either of the word identification tasks these hypotheses were not rejected.

Conclusion

It had been hypothesized that the negative behavior children would score higher on the word identification tasks with constant words, than on the word identification tasks with variable words. The mean scores for these tasks indicated that the negative

group did score higher on constant words for both the pre and post-tests. However, the results of the correlated t test for differences between means was not significant.

The results for the negative group for the word identification tasks are similar to those for picture identification. As previously indicated the small number of words used in this study may not have been sufficient to indicate significant differences and furthermore, it is possible that children exhibiting negative social behavior require more direct teaching.

Hypothesis 6

There is no significant difference between the scores obtained by the positive social behavior children on picture identification of constant words and picture identification of variable words.

This hypothesis was not rejected since the correlated t test for differences between means and variances for picture identification of constant versus variable words for the positive group was not significant.

Conclusion

It has been hypothesized that the positive social behavior group would score equally high on the picture association tasks for constant and variable words. Thus the data for hypothesis 6 confirm this expectation. The mean scores of the positive group for this task were 5.79 for the constant words and 6.67 for the variable words. Although the difference between these means was

not significant it appears that for the positive group, the learning of picture-association of constant words was an easier task than that of learning the variable words.

Hypothesis 7

There is no significant difference between the scores obtained by the positive social behavior children on:

(a) pre-test scores for constant and variable words

(b) post-test scores for constant and variable words

(a), (b) These hypothesis were not rejected since there were no significant differences between the means for word identification of constant and variable words for the positive group.

Conclusion

As had been hypothesized, the positive group performed equally well on the word identification tasks for constant words as for variable words. The mean scores indicated that the positive group received slightly higher scores for constant words on the pre-test, and slightly higher scores for variable words on the post-test. Therefore, it appears that the positive social behavior children are able to learn to identify and to remember words equally well by either of the approaches used in this study.

Hypothesis 8

There is no significant relationship between word and picture identification scores and:

(a) sex

(b) I.Q.

(c) chronological age

(d) reading accuracy

(e) reading comprehension

(a) The analysis of variance showed that there were no significant differences between boys and girls on picture identification scores. Therefore, this hypothesis was not rejected.

(b) This hypothesis was rejected for picture identification as there were significant negative correlations between picture identification scores for constant and variable words and I.Q. scores for the total sample ($p < .01$), the negative group ($p < .01$), and the positive group ($p < .05$). This hypothesis was also rejected for word identification of constant and variable words for the total sample as there were significant correlations between I.Q. scores for the total sample and word identification scores for pre and post-tests for constant and variable words. The hypothesis was not rejected for word identification of constant and variable words for pre and post-tests when the total sample was further subdivided into positive and negative behavior groups.

(c) This hypothesis was not rejected since there were no significant correlations between chronological age and word and picture identification scores.

(d) This hypothesis was rejected for the total sample, and the total negative behavior group for all six identification tasks. The correlations for reading accuracy and all six picture and word identification tasks were significant beyond the .05 level of

significance.

(e) This hypothesis was rejected for the total sample as there were significant correlations at the .01 level of significance for all six identification tasks and reading comprehension scores. This hypothesis was not rejected for the positive and negative groups and picture identification nor for the negative group on the following word identification tasks: constant words pre-test, variable words pre and post-tests. The hypothesis was rejected for the positive group for the pre and post-tests for constant words and the pre-test for variable words.

Conclusion

The present data indicate that boys and girls did not differ on their scores for the picture identification tasks. It was also found that boys and girls did not differ on their reading accuracy and reading comprehension scores. However, correlations between behavior scores and word identification scores indicated a close relationship for both the positive and negative behavior girls, but not for the boys. This appears to reinforce the views of Glick (1972) who indicated that educators and parents react differently to the reading achievement of boys and girls. He found that boys were punished for not achieving, but in contrast to girls who were praised and reinforced for school achievement, boys were neither praised nor reinforced for achieving.

The results of this study indicate that intelligence (as measured by the Canadian Cognitive Abilities Test) is highly related

to scores for picture identification, but that word identification scores are not as dependent on intellectual ability. It appears that the picture identification tasks which involve an association and memory factor are similar to tasks found in I.Q. tests while word identification tasks and reading possibly involve other skills.

The current data indicate that the variable of chronological age has a minimal relationship to word and picture identification scores. Although there was a spread of eighteen months in the chronological ages of the subjects in this study, the ability to identify pictures and words was not related to the age of the children.

The ability of the child to identify pictures and words is related to reading accuracy. The relationship of the positive behavior children who have higher reading accuracy scores is not as consistent as that for the negative behavior children. This means that the negative behavior children are consistently low in both reading and picture and word identification scores and seem to employ a limited number of skills in completing these tasks. However, the positive behavior children appear to have many more skills at their disposal than may be needed for the correct pronunciation of words.

The current data pertaining to picture and word identification and reading comprehension, indicate that the ability to understand reading material and the ability to associate the correct verbal response to a picture are not closely related.

This raises the whole question of the relationship of pictures and reading comprehension. At this early grade level, word pronunciation appears to be much more crucial to understanding what is read. Thus, from this study, it appears that meaning is carried through words and that word accuracy is a crucial factor in reading comprehension.

III. SUGGESTIONS FOR FURTHER RESEARCH

1. A follow-up study, using the present sample, may reveal further information with regards to the consistency of the subject's approach to learning and the continuity of the behavior of the subjects. It would be very interesting if the sample could be followed through high school to determine possible relationships between social behavior and school drop-outs.

2. Research might be conducted which focused on methods of modifying unacceptable social behavior which could be interfering with the learning strategies of children exhibiting negative social behavior.

3. Research could possibly be conducted which focused on approaches to reading which differ from those used in the present study. It is highly possible that another approach to learning to pronounce and remember words would be more effective for children who exhibit negative social behavior.

4. A follow-up study, using the design of the present study but including a larger number of constant and variable words might indicate that constant words which contain a spelling pattern are

indeed most effective for negative behavior children. It is further suggested that the attention of the negative behavior children be directed to the constant part of each word on each presentation of the word, as it is possible that these children require more direct teaching.

5. Further research could be designed to teach and test children in small groups or in the regular classroom, to determine if the presence of other children would further interfere in the learning strategies of negative social behavior children.

6. Further research could be carried out to determine if some of the differences in reading achievement and learning strategies of the positive and negative behavior children could be accounted for by differences in intelligence. In this study, an apriori t test was used to determine if the groups differed with regards to intelligence as measured by the Canadian Cognitive Abilities Test. Although there were no significant differences between the means of the two groups, the mean I.Q for the positive group was 112.62 as compared to the mean I.Q. of 106.58 for the negative group.

IV. IMPLICATIONS

1. The results of this study suggest that the negative social behavior children differ from the positive social behavior children in their reading achievement and in their learning strategies for both constant and variable words, as indicated by their scores on picture and word identification tasks. Thus, it

would seem that the negative social behavior interferes with learning and that steps should be taken to alleviate this situation. The focus should be on prevention since children exhibiting negative social behavior which interferes with success in reading can be identified at this early grade level.

2. This study highlights the need for the prevention of reading failure by a team approach. It is apparent that more liaison between the teacher, the reading specialist and the counsellor is necessary to combat the dual problems of the poor reader who exhibits negative social behavior.

3. The results of this study further suggest that the Devereux Child Behavior Rating Scale is a good predictor of reading achievement.

4. The results of this study suggest that the positive behavior children appear to learn by either of the methods used. However, this is not so for the negative behavior children. The findings of this study indicate that the constant words were somewhat easier for the negative behavior children to learn. Thus, it would seem that for the negative behavior children, teachers should investigate different approaches in teaching word identification.

5. The visual and auditory screening tests which were administered to all of the children in this study identified six negative behavior children (five with poor hearing and one with poor vision). Thus, these results indicate the necessity for

visual and auditory screening of all pre-school children.

6. The present study showed the differences in learning and achievement of the two behavior groups. It is suggested that positive and negative behavior children be grouped when being taught to identify and remember words. Benefits derived from such grouping could include the reduction of both frustration and negative comparisons with more able students. However, it is important that the negative children would work with the class as a whole on other tasks so that the behavior of the positive children would provide a good model for the negative children.

V. CONCLUDING STATEMENT

This study attempted to measure the overt social behavior of grade two children and to study the learning strategies of these children with constant and variable words in picture and word identification tasks.

Findings showed that the two behavior groups differed on reading achievement and that there was a significant relationship between behavior rating scores and reading achievement scores. It was also found that the two behavior groups differed significantly on picture and word identification tasks with both constant and variable words.

Although both behavior groups performed better on identification tasks involving constant words, there was no significant difference favoring the learning of either constant or variable words.

There were significant correlations between picture and word identification tasks and I.Q. and reading achievement. However, there were no significant correlations between picture and word identification tasks and chronological age.

Boys and girls did not differ in their performance on the various learning tasks nor on their reading achievement scores. It appeared that reading achievement related more to social behavior ratings than to the sex of the children in the sample.

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A P P E N D I X A

CONSTANT AND VARIABLE NONSENSE WORDS

AND THEIR FREQUENCY COUNTS

Constant Words	Variable Words
inchor	ducant
minter	remple
stinty	cantal
kilint	midler
popsin	artern

Frequency Counts

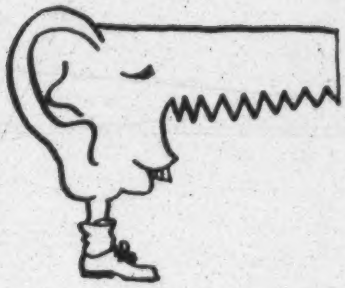
inchor	in (13)		chor (1)
ducant	du (13)		cant (1)
minter	min (7)		ter (42
remple	rem (7)		ple (41)
stinty	st (58)	in (37)	ty (42)
cantal	ca (54)	nt (39)	al (42
kilint	kil (5)	in (153)	t (216)
midler	mid (5)	le (119)	r (214)
popsin	pop (2)	sin (8)	
artern	art (2)	ern (8)	

APPENDIX B

NONSENSE WORDS AND NEUTRAL PICTURES

Constant Words

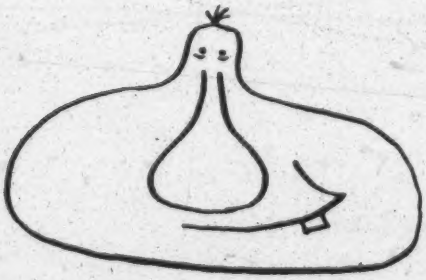
popsin



minter

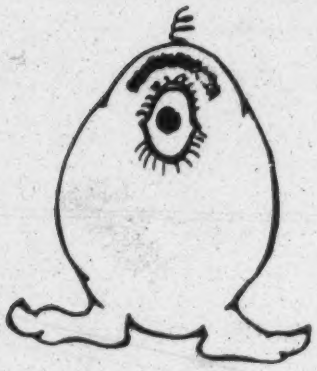
stinty

kilint

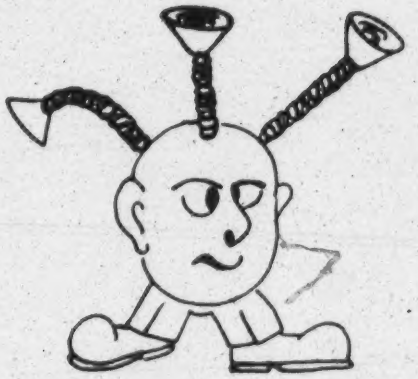


inchor

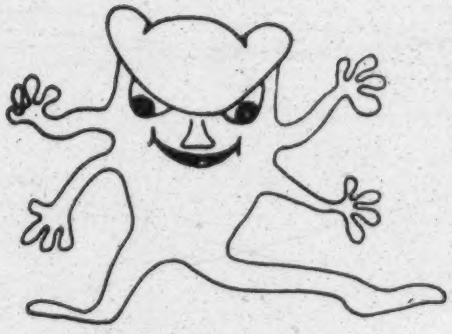
Variable Words



artern

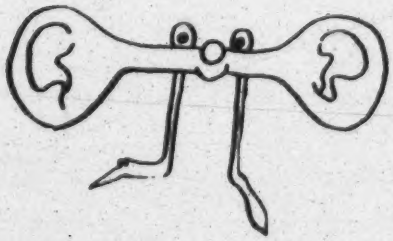


cantal



midler

ducant



remple

A P P E N D I X C

INSTRUCTIONS AND PROCEDURES FOLLOWED FOR WORD AND PICTURE IDENTIFICATION

INSTRUCTIONS AND PROCEDURES FOLLOWED FOR

WORD AND PICTURE IDENTIFICATION

When the subject arrives at the testing session, the experimenter introduces herself and says: "I have some things for you to do and I think that you will enjoy doing them. Before we begin, I would like to tell you why you have been asked to come here today. The reason is this. I want to find the best way to teach children how to read, and since you already know how to read, I think that you can help me find the answer to this question. See this funny looking picture and word? I made up this brand new picture and word that nobody has ever seen before. I am going to give you a chance to learn four of these new words right now. O.K.?"

"Before we begin, would you read this little story to me. Some of the new words that I made up are in the story and I want to see if you can read them." The experimenter marks the number of nonsense words correctly pronounced within a five second time limit.

Constant spelling pattern words

"All of these words have these two letters in them (show card with "in" printed on it.) Do you know what these letters say? Yes, they say "in" (If subject does not know, tell him). Show sample card. "This is a practice word. I will tell you what it is and then I want you to remember it so that when I show you the picture again, with the word covered up I want you to tell me the name of the picture. This word is _____. Now, you say it.

Notice that these two letters (point to constant letters) are in each of these words. Look at each card very carefully and try to remember the words." The experimenter then shuffles the word cards.

Teaching cycle

The experimenter presents each card, pronounces the corresponding words, and asks the subject to pronounce the word. This procedure is followed for the other three cards.

Picture Identification cycle

The experimenter shuffles the word cards and shows the first picture with the word covered. She asks, "What is this called?" If the subject is correct, say "yes this is _____" and expose the word for the subject to see. If the subject fails to respond within five seconds or gives an incorrect response, expose the word and say "No, this is _____." This procedure is repeated until the subject identifies all four cards correctly or for a maximum of ten trials.

Variable Words

"Now we are going to learn some more words. This is the practice card for this group of words. Look very carefully at the letters while I pronounce the word. This word is _____. Now you say it. Lobk at each card very carefully and try to remember the words." The experimenter then shuffles the word cards.

The teaching cycle and the picture identification procedure as outlined for the constant words is repeated for the variable words.

APPENDIX D

PRE-TESTS FOR VARIABLE AND CONSTANT WORDS

Constant Words - Pre-Test

I can see Bob.

Spot is his inchor.

Bob has a minter.

She is Jane.

Jane has a kilint.

Bob and Jane like stinty.

Variable Words - Pre-Test

The girl has a ducant.

The girl is cantal.

The cat is midler.

Puff is gray.

Father is in the artern.

Father works hard.

APPENDIX E

POST-TESTS FOR CONSTANT AND VARIABLE WORDS

Constant Words - Post-Test

Look, inchor, look.

See minter go.

I go up.

I come down.

Come here stinty.

Come and play with kilint.

Variable Words - Post-Test

Look, Father.

See the ducant.

I want cantal to play.

We can play midler here.

Come Father.

Play ball with artern.

A P P E N D I X F

TABLE OF ANALYSIS OF COVARIANCE BETWEEN THE GROUPS FOR PICTURE AND WORD IDENTIFICATION WITH I.Q. SCORES COVARIED OUT

APPENDIX F

SUMMARY OF ANALYSIS OF COVARIANCE BETWEEN THE GROUPS FOR PICTURE AND WORD IDENTIFICATION WITH I.Q. SCORES COVARIED OUT

Variable	Source of Variation	DF	MS	F
Picture Identification of Constant Words	Between Groups	1	66.54	12.69 **
Picture Identification of Variable Words	Between Groups	1	35.40	7.43 **
Post Test Word Identification of Constant Words	Between Groups	1	8.33	11.71 **
Post Test Word Identification of Variable Words	Between Groups	1	6.33	9.09 **

** Significant at the .01 level

APPENDIX G

THE DEVEREUX ELEMENTARY SCHOOL BEHAVIOR SCALE

PREVIOUSLY COPYRIGHTED MATERIAL IN
APPENDIX G NOT MICROFILMED:

p. 1 - 4